

# ***INCOMING: THE UNINTENTIONAL “COMING” OF TECHNOLOGY IN MATHEMATICAL DOINGS***

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Research in mathematics education increasingly emphasizes the importance of tools and technology in mathematical doings (e.g. Hoyles & Lagrange, 2010). This poster illustrates the concept of *incoming* technology as a new way to conceptualize tools and their use when doing mathematics. Briefly put, tools and technology are generally considered as “means to an end” in relation with teaching, learning or simply “doing” mathematics. But tools also *exceed* intentions in various ways, bringing in more than what we expect (e.g. Rabardel, 1997). More so, tools even precede and preform intentionality, including those of mathematics educators. Based on data gathered through my studies and theoretical reflections these provoked, the concept of *incoming* technology was developed to positively address the inevitable unintentional “coming” at the heart of tools and their use when doing mathematics (Maheux, 2014). Instances of such unintentional “coming” of technology are found in the many ways tools present possibilities that are unrelated to the mathematical activity for which they were designed. Students playing games or storing cheat sheets in their graphing calculator are one class of examples. Another is in how tool use is also synonymous with potential breakdown, for example when hardware malfunctions and software crashes or glitches: geogebra online forum shows many ‘mathematically wrong’ constructions. Thinking with *incoming*, such interferences are seen as occasions to step back and reconsider what we do, question intentions, and what we take for granted. Beside this, it also became clear that the divergence characteristic of *incoming* is also at the heart of *invention*. Tools are one source of the positive surplus by which we discover things that were not intended. For example, I observed pupils serendipitously finding regularities in decimal development of whole numbers divisions while we invited to “play” with calculators, and older students coming across a convergence when repeatedly running a sin (ANS) command. Finally, the concept of *incoming* also brings forth the situated nature of technological outbreaks. What is once failure or discovery for someone is not necessarily in different circumstances or for somebody else, and attitude is determinant in the way one respond to technological provocations. New questions relate to how we prepare for the unpredictable so we can welcome it in the most productive way.

## **References**

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